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SURVEY OF NEEDS FOR MUNICIPAL WASTE TREATMENT FACILITIES

Environmental Protection Agency
Washington, D. C.

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Environmental Protection Agency
Office of Water Programs
Division of Municipal Waste Water Programs
Washington, D. C. 20460

TABLE OF CONTENTS

ABSTRACT i

PURPOSE 1

BACKGROUND 1

SURVEY PROCEDURE - DECEMBER 1971 ASSESSMENT 3

SURVEY FINDINGS 7

THE TOTAL NEEDS 11

RELATIONSHIP OF DECEMBER 1971 ASSESSMENT TO PREVIOUS ASSESSMENTS . . 12

SUMMARY 13

ABSTRACT

SURVEY OF NEEDS FOR MUNICIPAL WASTE TREATMENT FACILITIES

In the Fall of 1971 the Division of Municipal Waste Water Programs completed a survey of construction needs from Fiscal Year 1972 to Fiscal Year 1976 for municipal waste treatment plants serving populations of 10,000 or more persons. About 2300 municipalities serving 10,000 or more people were asked to submit their needs which were then checked by EPA Regional Offices and State offices. Printouts of the figures were mailed to municipalities for a final check on accuracy.

For a number of reasons it is considered essential that an estimate of the Nation's need for sewage treatment facilities be developed by conducting a survey of individual municipalities, rather than by a sampling technique which extrapolates with a mathematical model. First, through its ten Regional Offices which are in continuous contact with State and municipal agencies, EPA is in a position to readily examine needs at their source, the local level. Second, imminent needs, as well as a significant number of projected needs, particularly those in large metropolitan areas, have been calculated by local engineers or consulting firms and therefore are known and do add to the validity of a total needs estimate. Third, regional and intra-regional differences are significant enough to make representative sampling difficult. Fourth, the survey provides the States with detailed information on local needs and encourages them to think ahead in their own program planning. Fifth, the information collected has a geographical component and therefore can be retrieved from the files by congressional district, county, river basin, etc., making it amenable for replying to a wide variety of inquiries. Sixth, the survey obtains a signature from the respondent. Hence, responsibility for the estimate is readily fixed at the municipal level.

The municipalities for 10,000 or more persons surveyed accounted for 77% of the total needs. The remaining 23% of the needs occurred in communities of less than 10,000 persons and were taken from the pending needs file which is updated annually by EPA, utilizing the State one and

five-year needs projections. The estimated needs for communities of less than 10,000 (23% of needs) are thought to be less reliable than the survey (77% of needs). The gross figures for communities of less than 10,000 people could vary from 10% to 15% upwards or downwards.

The 1971 assessment estimated the total needs for the FY-1972 to FY-1974 period, as $14.6 billion. As Exhibit I indicates, this amount is effectively $3.2 billion greater than the 1970 assessment.

Several factors have accounted for this 28% rise:

1. Greater coverage (which, in turn, increased the accuracy). In the 1971 assessment, 2300 municipalities of 10,000 or more persons were contacted; the 1970 survey canvassed 450 municipalities with projects of $5 million or more.

2. Heightened interest at the local level. Many municipalities have become aware of the need to meet water quality standards and implementation plans during the next five years. Enforcement actions have accelerated antipollution efforts which had been latent.

3. Timing of financial incentive. For example, in California the estimated needs rose by $.69 billion between the 1970 assessment and the 1971 assessment because the State advised its communities that any project not started in the next five years will not be eligible for State assistance.

4. Recognition of need for higher level of treatment and the costs associated with these higher levels. The 1971 assessment indicated a considerable rise in the number and cost of tertiary facilities required, as compared with the 1970 assessment. While the two assessments are not strictly comparable, the figures show:

	Estimated Cost ($ Billions)		
Type of Need	1970 Assessment	Increase	1971 Assessment
Tertiary Treatment	1.01	+1.25	2.26

The estimated construction cost of needed municipal waste treatment facilities for all communities for the five-year period ending with FY-1976 (the 77% of the needs taken from the survey and the 23% from the pending needs file) is:

Fiscal Year	$ Billions	Percent
1972	5.28	29.2
1973 - 1974	9.28	51.3
1975 - 1976	3.52	19.5
Total	18.08	100.0

A detailed breakdown by State is shown in Exhibit II. The figures for FY-1972 and FY-1973-1974 are considered more reliable than those for FY-1975-1976 since the latter involved plans and specifications which have not been developed as fully as the former.

The survey provided some insight concerning the composition of the needs of municipalities of 10,000 or more. Exhibit III shows the majority of needs to be for secondary treatment, tertiary treatment, and interceptor sewers. Exhibit IV shows that 58% of the needs are for new facilities and 42% for modifications and improvements.

The survey also showed that:

1. 15.5% of the anticipated construction in municipalities of 10,000 or more is to alleviate pollution from industrial sources.

2. 54% of the municipalities surveyed charge users on the basis of hydraulic volume.

3. 12,700 additional employees will be needed by the municipalities surveyed to administer, operate, and maintain the proposed facilities.

The needs figures, especially those covering FY-1972 through FY-1974, are viewed with considerable confidence because:

1. The municipalities surveyed itemized specific facilities for specific needs instead of giving a general construction estimate.

2. Local estimates were reviewed by States in conjunction with State plans and projections.

3. Following State reviews, the estimates were further examined by EPA Regional Offices.

Two factors must be considered when viewing the figures:

First, all costs are in 1971 dollars. No allowance is made for inflation which, during 1971, rose 12%.

Second, the needs were formulated by municipalities to meet the present water quality standards. Tightening the existing standards or attempting a goal of zero discharge as provided in proposed legislation will cause the estimated needs to rise considerably.

EXHIBIT I

NEEDS ASSESSMENT SURVEYS

A Comparison of the December 1970 Assessment and the September 1971 Assessment

- The November 1970 assessment surveyed 450 municipalities chosen on the basis of having projects of $5 million or more.

- The September 1971 assessment surveyed 2300 municipalities chosen on the basis of having populations of 10,000 or more persons.

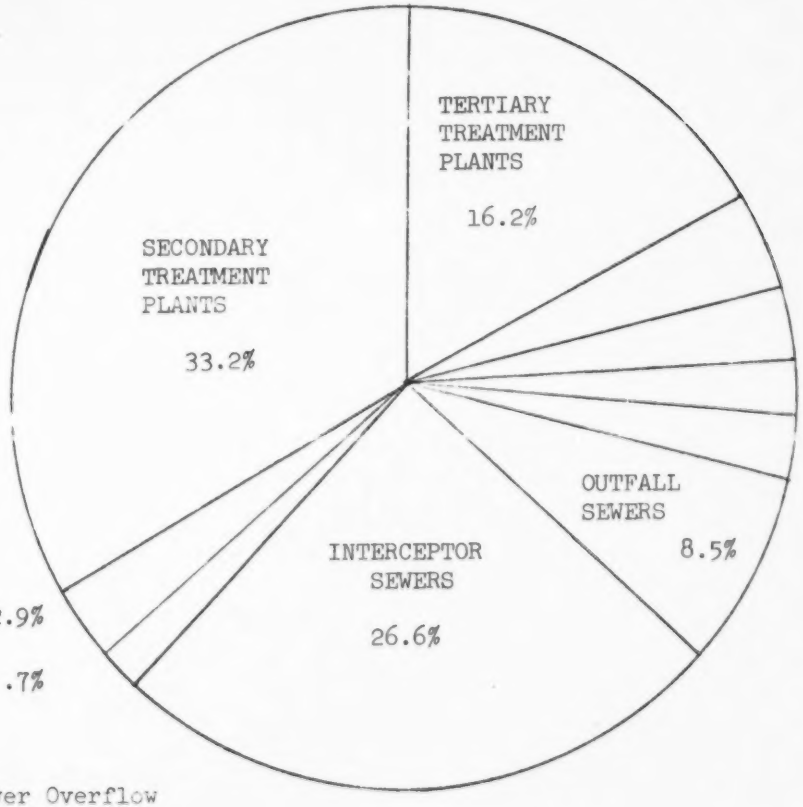
November 1970 need (1970 dollars)	$12.6 billion
Plus rise in construction costs of 12%	1.5
November 1970 need in 1971 dollars	$14.1 billion
Less projects funded between assessments (funded between 12/70 and 11/71)	2.7
Net unfunded need from 1970 assessment (1971 dollars)	$11.4 billion
Needs based on September 1971 assessment	14.6 billion
Rise in estimated needs	$ 3.2 billion

BREAK DOWN BY STATE
ESTIMATED CONSTRUCTION COST OF NEEDED SEWERAGE TREATMENT
FACILITIES FOR ALL MUNICIPALITIES FOR THE PERIOD FY-1972-FY-1976
AS OF NOVEMBER 1971
($ Millions)

	FY-1972	FY-1973-1974	FY-1975-1976	FY-1972-1976
TOTALS	5,278.2	9,279.0	3,525.8	18,083.0
Alabama	33.5	19.2	13.0	65.7
Alaska	4.1	28.7	7.5	40.3
Arizona	10.7	8.9	7.6	27.2
Arkansas	12.5	39.0	10.0	61.5
California	280.4	1,149.3	709.8	2,139.5
Colorado	23.3	22.8	36.1	82.2
Connecticut	96.2	148.6	--	244.8
Delaware	7.8	87.8	8.1	103.7
Dist. of Columbia	62.7	40.9	--	103.6
Florica	313.0	215.1	123.3	651.4
Georgia	36.3	105.4	12.6	154.3
Hawaii	15.0	33.1	24.1	72.2
Idaho	15.7	16.0	.7	32.4
Illinois	336.7	573.3	421.6	1,331.5
Indiana	161.3	328.9	49.7	539.8
Iowa	16.8	151.5	29.0	197.3
Kansas	19.8	34.7	14.8	69.3
Kentucky	46.8	49.4	66.6	162.8
Louisiana	68.5	68.8	17.8	155.0
Maine	25.4	115.5	60.4	201.3
Maryland	201.5	418.7	52.3	672.4
Massachusetts	206.5	340.7	80.0	627.2
Michigan	331.8	830.5	230.4	1,392.6
Minnesota	142.3	153.6	43.7	339.6
Mississippi	32.5	24.8	32.7	90.0
Missouri	9.2	231.9	65.5	306.5
Montana	13.7	10.6	3.0	27.3
Nebraska	1.8	52.3	39.8	93.9
Nevada	.4	41.5	1.3	43.1
New Hampshire	21.3	99.7	69.0	190.0
New Jersey	461.9	660.1	305.9	1,427.9
New Mexico	17.8	12.9	--	30.8
New York	1,047.1	563.3	269.2	1,879.6
North Carolina	36.6	97.8	19.3	153.7
North Dakota	1.4	5.4	.3	7.1
Ohio	277.2	563.7	219.5	1,060.4
Oklahoma	14.4	52.7	47.9	115.0
Oregon	41.5	82.2	25.6	149.2
Pennsylvania	187.2	602.3	77.0	866.5
Rhode Island	9.9	61.3	--	71.2
South Carolina	31.2	62.8	36.6	130.6
South Dakota	9.3	4.5	4.3	18.1
Tennessee	120.0	48.4	19.7	188.7
Texas	127.6	272.8	45.9	449.3
Utah	14.1	6.0	6.9	27.4
Vermont	5.3	27.0	10.0	42.3
Virginia	100.0	324.4	72.5	497.4
Washington	38.1	91.6	58.4	188.1
West Virginia	36.2	34.6	23.0	93.8
Wisconsin	135.1	118.5	10.5	264.1
Wyoming	1.5	2.4	--	3.9
Guam	2.2	10.5	4.8	17.5
Puerto Rico	4.2	124.6	1.3	130.1
Virgin Islands	8.0	5.0	6.9	19.9

EXHIBIT III

DESCRIPTION OF FACILITIES REQUIRED* BY MUNICIPALITIES
SERVING POPULATIONS OF 10,000 OR MORE
(Based on July - September 1971 Needs Survey)



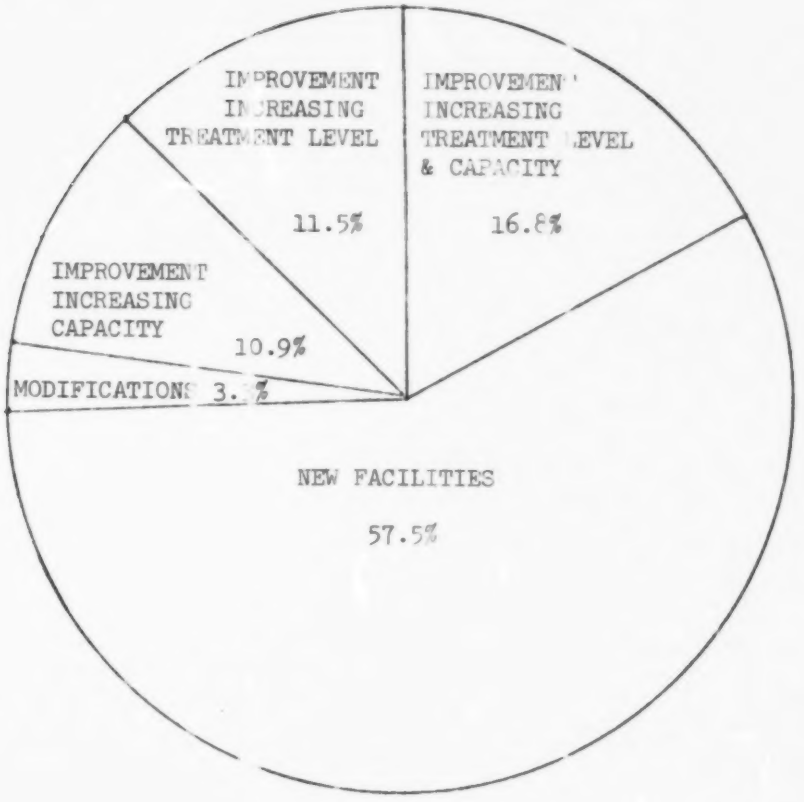
* Excludes Combined Sewer Overflow Control Facilities which are not included in the total needs figures

EXHIBIT IV

TYPE OF FACILITIES NEEDED BY MUNICIPALITIES SERVING POPULATIONS OF 10,000 OR MORE

	$ Millions	Percent
New Facilities	$ 8,049.7	58%
Modifications & Improvements	5,964.3	42%
Needs of Communities of 10,000 or more	14,014.0	100%

SPECIFICALLY



SURVEY OF NEEDS FOR MUNICIPAL WASTE TREATMENT FACILITIES

PURPOSE

This survey was conducted to update EPA estimates of the scope and cost of construction of municipal waste treatment facilities, planned through Fiscal Year 1976 -- needed to meet current water quality standards implementation schedules or other current standards or enforcement requirements.

BACKGROUND

The Environmental Protection Agency, through the Division of Municipal Waste Water Programs, Office of Water Programs, has continuously maintained a file of the waste treatment facility construction needs of municipalities.* These needs data have been stored in the Division's Pending Needs file and are updated monthly to reflect the initiation of projects receiving grant offers, as well as reported changes in project costs and grant amounts. The primary source of both the original and new information in this file has been the one and five-year lists of needs submitted by the States annually as part of their State Program Plan.

In July 1970, attempts were made to reconcile municipal needs data in the EPA (then FWQA) Pending Needs file with needs data developed in a survey conducted by the National League of Cities. In the process, direct contacts were made with many of the larger cities in order to reconcile the differences between the data which had been furnished to EPA (FWQA) on these same communities by the States, with that obtained directly by the National League of Cities. From this effort, a weakness in the file of needs information maintained by EPA became evident -- namely, the needs for many facilities, particularly those in the larger municipalities, had not been fully reported by the States.

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*The word municipality as it appears here is used as defined in PL 84-660, as amended, as "a city, town, county, borough, parish, district, or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, and an Indian tribe or an authorized Indian tribal organization."

In December 1970, EPA, in an effort to upgrade its State acquired data, undertook directly a limited assessment of the Nation's needs. This involved contacting cities with projects estimated to cost $5 million or more in order to substantiate the reported needs and cost of planned construction in those cities. Since the combined cost of projects in these cities represented an estimated 75 percent of the cost of the total National needs, it was believed that the verification and updating of these figures would improve the credibility of the total needs amount. The estimated total needs figure reported for the period FY 1972, 1973, and 1974, following the December 1970 assessment, was $12.56 billion. Table 1 of the Attachment gives a State-by-State summary.

From both the July and December efforts, it was concluded that significant discrepancies existed between data on the cost of constructing needed municipal facilities reported by the States and cost data reported by the individual municipalities. For this reason, a more careful examination of municipal needs at the municipal level was considered necessary. Since, for practical purposes, all cities could not be contacted to determine their best cost estimates, the decision was made to conduct a survey limited to municipalities with or serving populations of 10,000 or more, since about 85% of the needs were estimated to exist in these municipalities. Approximately 2300 municipalities serving an estimated 155 million persons were identified for this purpose. With substantive estimates from this large block of municipalities, EPA would be able to develop operational plans and legislative proposals for meeting the construction needs which must be faced in the immediate five-year period with confidence and objectivity. Under these considerations, the decision was made to initiate a new survey in July 1971.

SURVEY PROCEDURE - DECEMBER 71 ASSESSMENT

Building upon experience from previous assessments, a plan for conducting the new survey was devised. The plan included (1) the identification of the data to be generated and making the data amenable to an existing Office of Water Programs automated system (to facilitate storage and retrieval); (2) the identification of the specific municipalities serving populations of 10,000 or more; and (3) the arrangements for a more direct involvement of the States and communities in the survey. It was also determined that the Regional Offices would continue to play the major role in dealing with the States and municipalities. Accordingly, instructions, lists of cities, and survey forms were prepared for the Regions which, in turn, would proceed as follows:

a. Examine and correct the listings, where necessary.

b. Notify the States of the survey plan -- to determine the State's preference as to whether EPA should deal with municipalities through the States or directly.

c. Mail the survey forms and instructions to the municipalities, either directly or through the States.

d. Have the municipalities return the completed survey forms to the Regions.

e. Enter the initial data furnished by the municipalities into the computer, via the Regional computer terminal.

f. Send a copy of the computer prepared printout containing initial data for all communities in the States to each State for review and verification at the State agency level.

g. Receive from the States fully completed survey forms showing the final data.

h. After Regional review, enter the data into the OWP central computer via the terminal.

The analysis of the data and report preparation by the Office of Water Programs, at Headquarters, was performed on the computer stored data as it became available.

To test the concept and operating elements of the survey plan, a pilot survey was conducted in the States of Alaska, Idaho, Oregon, and Washington during May and June of 1971. Based on experience with the pilot study, the instructions and procedures were appropriately modified prior to initiation of the full scale survey.

The survey, in its formative period, was a joint effort by the Division of Municipal Waste Water Programs and the Division of Applied Technology. The former was responsible for the conduct of the survey and the gathering, analysis and reporting of the data. The Applied Technology Division was responsible for the development of the survey form and for the input, storage and retrieval of the data. Since it was deemed necessary to store the survey data in an existing central data bank so that the new data could be related to already available data on water pollution control facilities, the Office of Water Programs Inventory file was selected as the repository for the survey information. This decision required that the format and element structure of the survey conform to the inventory system (storet) operated by the Division of Applied Technology.

With the survey being managed by Municipal Waste Water personnel and the gathered information being stored in and retrieved from an automated file operated by Applied Technology personnel, a close operating relationship had to be established between the two separate organizations in order to effectively carry out the survey operation. The development of a collaborative effort at the Regional level was brought about by the conduct of a joint survey orientation meeting involving representatives from the two Headquarters organizations and their Regional counterparts. Through the orientation meeting, each group's separate and common responsibilities and the required sequence of events and concomitant timetable were clarified, and the stage was set for launching the survey with a sense of unity and common direction.

As a first step in carrying out the survey, the Regional Offices were requested to examine the list of municipalities identified from the OWP Inventory File to screen out entries which were recognized as (a) currently nonexistent (in terms of providing pollution control services); (b) having had their needs fulfilled and/or (c) otherwise in error.

Following the screening, the next step was to determine the municipal addressee who would be in the best position to provide the required information. In the smaller municipalities -- many of which, in recent years, became parts of sewer authorities -- this was a difficult but necessary task. Concurrently, the States were advised of the details of the survey, provided with a list of the municipalities to be assessed, and offered the opportunity to contact the municipalities themselves if they felt it was in their interests to do so. The States generally agreed to EPA going directly to the municipalities. The third step consisted of the Regions mailing to each municipality three copies of the survey form, along with instructions and a letter advising them of the purpose and need for the data.

In accordance with the survey plan, if a response was not received in two weeks, a follow-up was initiated by the EPA Regional Office. This prompting with telegrams, telephone calls, special delivery letters, etc., continued weekly until the municipalities responded. In many instances, the survey form had to be revised and forwarded again, as the community's serving organization had recently changed. In some cases, where municipal responses could not be obtained by mail, the form was completed jointly with Regional Office staff through a face-to-face visit or telephone conversation with the proper municipal officials. Most of the visits were made to those municipalities whose needs would greatly impact the survey. For example the large-scaled and diverse needs of Chicago were discussed in a joint session to provide additional assurance that a full and accurate response would be obtained.

Responses, as they were received in the Regions, were examined for completeness and adherence to instructions. As necessary, follow-up calls were made to get additional information or otherwise clarify municipal entries. The complete and corrected forms were then turned over to Regional Technical Data and Information staffs for coding, key punching, storing and retrieving using Regional computer terminals. Printouts of the entered survey data, produced from the terminals, were then returned

to the Regional Waste Water Program staff where they were checked against the original. As required, corrections were made and, when ready, a clean computer prepared printout of the survey form, as submitted by the municipality, was mailed to the State for its review and entering of the State's dates of expected project construction and operation.

The State-reviewed form was then returned to the Regions where the data were again examined and compared with need data recently received from the States as part of their annual program plan (one and five year lists). Discrepancies were reconciled and the data were entered into the terminal. Copies of the completed survey form were sent to the State and municipality for their information.

Data from the survey and the State's needs lists were then used to update the Pending Needs file.

A flow chart of the survey operation, Figure A-1, along with a copy of the survey form and instructions are included in Appendix A of this report.

Headquarters Operation

When the survey was initiated, it was recognized that -- given the usual obstacles to be faced in assessing the needs of 2300 municipalities by mail, the ten week period to complete the cycle, and the fact that those responsible for the conduct of the survey had other full time duties to perform -- the ideal goal of 100% completion would be difficult to realize. Yet, despite the difficulties, a high rate of return was achieved. Of the approximately 2300 municipalities surveyed, returns were received from over 95%. A general appraisal made of those municipalities from which returns were not received indicated that, since most of them had populations at or just over 10,000, the probability was high that their needs, if any, would be relatively small. A summary of the responses is presented in Table 2.

Survey data stored in the central computer via the Regional terminals were extracted by the Division of Municipal Waste Water Programs for analysis and reporting. Initially, a series of test summaries were made

against various elements of the data in the survey file to determine their completeness and reasonableness. Omissions and otherwise questionable data were searched for and brought to the attention of Regional personnel to ascertain the reasons for the missing and/or otherwise questionable entries. Necessary corrections to the central computer file followed.

SURVEY FINDINGS

Summaries and analyses of the various elements of data obtained from the 2300 cities contacted through the survey are presented below. The figures relate to the construction needs of municipalities with or serving populations of 10,000 or more. Information on the needs of municipalities with populations of less than 10,000 are discussed later in the report.

1. Cost of Eligible Projects

The estimated total cost of constructing needed waste treatment facilities for the 5-year period FY-72 through FY-76, for municipalities of or serving 10,000 or more persons is just over $14.0 billion. This estimate is based on 1971 construction costs, and excludes the cost of needed combined sewer overflow control facilities.

Construction of the $14 billion in projects is expected to be phased over the five year period as follows:

FY	$ Billion	%
1972	3.55	25.3
1973	4.94	35.3
1974	2.51	17.9
1975	1.87	13.4
1976	1.13	8.1

Tables 3 and 4 present the cost on a State-by-State and fiscal year basis.

2. Relation of Construction to Regulatory Requirements

The responding municipalities were requested to indicate the reason for planning the construction reported. Table 5 shows,

in summary form, the cost of constructing required facilities and the associated requirements to be fulfilled. It should be noted that approximately 83% of the costs are (nearly) equally distributed among three requirements, namely, because of (a) locally developed plans, (b) State approved implementation schedules, and (c) Federally approved water quality standards implementation plans.

The high percentage of cost associated with local requirements -- rather than Federal or State -- can be attributed in a large measure to the fact that Federally approved water quality standards implementation plans for many areas are, at this time, either outdated, require revision, or are in the development stages. In many instances, water quality standards and implementation plans had not been communicated to the municipalities in the form of a court order, etc., hence the respondent indicated "locally developed plan." Clearly, most of the needs noted here are in anticipation of Federal/State requirements. Few projects are being planned to meet needs above and beyond existing and/or expected Federal/State standards or requirements. (It should be noted that 60% of the reported needs to meet locally developed plans are for interceptors and pumping stations, not immediately associated with required levels of treatment; 25% for upgrading existing plants; and 15% for new plants.)

Approximately $220 million in construction is to be initiated because of more stringent Federally approved water quality standards, and over $2.1 billion in construction is required because of enforcement procedures and/or State and Federal court orders.

3. Description of Facilities

Table 5 summarizes the cost of needed facilities for the five-year period, by description and type. The details are discussed below.

a. New vs Modified Works:

Summaries of the responses on the type of construction planned indicated that approximately 58% of the expected

expenditures are for the construction of new facilities and 42% for modifications and improvements. As shown in Table 6, most of the modifications are for the purpose of increasing plant capacities and treatment levels.

b. Plants vs Ancillary Works:

Approximately 53% (or $7.4 billion) of the cost of needed facilities is for the construction of new or improved plants and 41% (or $5.7 billion) is for ancillary works, such as pumping stations, interceptors, and outfall sewers. The remaining 6% is for projects involving individual plant elements (e.g. sludge processing and disposal operations and disinfection) and nutrient removal facilities. Of the approximately $5.7 billion to be used in the construction of ancillary works, about $3.7 billion is for interceptor sewers. The distribution of these anticipated expenditures is presented in Figure 1.

c. Level of Treatment:

An examination of the costs associated with the various levels of treatment indicates that of the estimated $7.4 billion for the construction of new and improved plant facilities, approximately 5.5% (or $405 million) is for primary treatment facilities; 1.3% (or $96 million) for the intermediate levels of treatment; 62.7% (or $4.647 billion) for secondary; and 30.5% (or $2.26 billion) for tertiary treatment facilities. Table 7 shows a State-by-State breakdown of needs for tertiary treatment facilities. It was found that 35% of the cost of tertiary needs are reported in the States of Illinois (22%) and Maryland (13%). California, Florida, Michigan, New York, Ohio, and Virginia each reported needs of over $100 million.

d. Nutrient Removal (Phosphate and Nitrate):

The estimated cost of facilities to be added to existing or proposed plants for nutrient removal is $325 million. Of this $148 million is for phosphates and $177 million is for nitrates.

75% of the phosphate removal costs and 45% of the nitrate removal costs are projected for municipalities located in the Great Lakes Region. A State-by-State breakdown of needs is presented in Table 7.

e. Combined Sewer Overflow Control Facilities:
The total cost of construction of combined sewer overflow control facilities planned by responding municipalities was reported at $1.63 billion. Evidence exists, however, that the survey identified a relatively small portion of the total needs. This can be attributed principally to the fact that many communities have not yet clearly identified their needs, and, therefore, do not have the engineering plans necessary for estimating costs. In addition, this can also be attributed to the emphasis in the instructions on providing data on facilities eligible for EPA grant assistance. Unless those completing the form carefully examined the full list of needs descriptions appearing in the instructions, notations on combined sewer overflow control needs could have been overlooked.

f. Industrial Waste:
Responding municipalities were requested to give the percentage of the effluent which, based on flow, can be attributed to industrial waste. Based on the number of need items, 46% showed no industrial waste component; for 43% of the needs, the percentage of industrial wastes (based on flows) ranged from one to 30%; the remaining 11% were in the 31% to 100% range. The summary result of applying the obtained percentages to the cost of projects involved, indicates that approximately $2.17 billion of the $14.0 billion in construction proposed for municipalities serving 10,000 or more persons during the next five year period, is for the purpose of alleviating pollution from industrial sources.

g. Operation of Proposed Facilities:
Expected facility operation dates and associated costs for the reporting municipalities are summarized in Table 8. In

addition to these, as of November 1, 1971, there were $4.6 billion worth of Federally assisted projects under construction and another $3.4 billion in the preconstruction stages, on which grant commitments had been made. These, too, will go into operation during this same period, i.e., beginning in FY-72.

4. User Charges

Table 9 summarizes the responses to the inquiry regarding the method upon which the user charge is based and the year the present usage rate was established. 54% of the municipalities indicated "hydraulic volume" as the basis for charging and 17% "both volume and quality." Nearly 29% indicated the use of methods other than those identified in the survey.

5. Additional Employee Requirements

Approximately 16,700 additional employees are reported to be needed in the municipalities surveyed, as a result of the construction to be initiated through Fiscal Year 1976. Of these 16% are for professional positions, 65% for operations and maintenance needs, and the remaining 19% are required to fill administrative support type jobs. About 5,700 or 45% of the employees will be needed by the end of FY-74; and, another 5,000 or 40% will be needed in FY-75 and FY-76. This information is summarized in Table 10. It is of interest to note that in the November 1971 EPA "Manpower Report to Congress," the number of additional employees needed through FY-76 was estimated at 13,900. This was based on information from a different set of sources.

THE TOTAL NEEDS

As previously stated, the total municipal needs data are maintained in the Pending Needs file which is updated annually with the submission by the States of their one and five year needs lists, and monthly with the awarding of grant offers and the notification of changes in project costs. Following the completion of the survey, this file was further updated with latest

construction costs estimates on municipalities with or serving 10,000 persons or more. Municipalities of or serving less than 10,000 had been updated during the July to September period through the one and five-year lists which the States had submitted with their FY-1972 Program Plan. Combining this information with that obtained through the survey gives the total estimated cost (in terms of 1971 dollars) of facilities whose construction is to be initiated during the period FY-1972-76, (exclusive of combined sewer overflow control facilities) of about $18.08 billion. The estimated cost of projects to be initiated through FY-1974, as shown in Table 11, on a State-by-State basis, is $14.56 billion. Table 12 provides a breakdown of the $18.08 billion by State -- showing FY-75 and FY-76 separately.

RELATIONSHIP OF DECEMBER 1971 ASSESSMENT TO PREVIOUS ASSESSMENTS

Total Cost

The estimated total cost of needed sewage treatment facilities for which construction must be initiated during the period FY-1972-74 as determined by the assessment completed in December 1971 is $14.6 billion. The previous assessment, completed in December 1970, showed a total need of $12.6 billion through FY-1974. Expressed in terms of 1971 dollars, the $12.6 billion would be $14.1 billion. One way of comparing the previous estimate with the current one is to adjust the December 1970 estimate to December 1971. This is accomplished by reducing it by the cost of construction, the need for which was eliminated by the award of grants during the period between the two assessments. Since new projects costing approximately $2.7 billion were assisted with EPA grant awards in the interim 12 month period, the $12.6 billion reported in December 1970 and escalated to $14.1 billion in 1971 dollars should now be down to $11.4 billion. Therefore, the difference between the 1970 and 1971 estimates expressed with reference to a common time frame and in common dollars is $3.2 billion.

Data gathered on the needs for FY-1975 and 1976 in the previous two assessments were relatively small, approximately one to one and one quarter billion dollars. However, according to the present survey, these needs are closer to $3.5 billion -- about a 300% increase.

A State-by-State comparison of the original December 1970 and December 1971 assessments of the needs through FY-1974 are shown in Tables 13 and 14. Thirteen States' needs rose between 50% and 100% and three exceeded 100%. The State having the largest cost change was California where the figures rose from $737.5 million in December 1970 to $1,429.7 million in December 1971. Most of the increase occurred in the San Francisco Bay area.

Nineteen States reported needs in December 1971 which were less than those reported in December 1970. However, in the case of 13 of these States, the addition of the needs in Fiscal Years 1975 and 1976 brings their totals in excess of those reported in December 1970. It is likely that the shifting of costs to FY-75 and FY-76 represents a more accurate labeling of the timing rather than a postponement of the construction.

It is difficult to make comparisons among the other (non-cost) elements of needs data as they were reported in the 1971 survey with similar data in previous assessments. Facility descriptive information, gathered in 1970, was not only limited to cities with projects costing $5 million or more, but the unit reported data was a "project" rather than a "need" -- as in 1971. (A project may be comprised of many needs.) A comparison between some of the data elements obtained in the December 1970 and December 1971 assessments is as follows:

Type of Need	Estimated Cost ($ Million) 1970	1971
Tertiary Treatment	1,014	2,261
Interceptor Sewer Cost	3,724	3,719
Industrial Share	1,630	2,165

SUMMARY

The data which have emerged from this assessment are considered to be the most complete and reliable to evolve on municipal waste treatment needs. Having been developed and/or examined for the first time at the municipal, State and Federal levels, the figures are fully representative and, as such,

are the kind upon which general agreement can be reached. And, having been identified in detail, the source data lends itself to a level of scrutiny which is not possible in cruder estimates. Therefore, the figures are considered as both a useful and practical measure of the cost and scope of the construction needs for sewage treatment facilities.

The reasons for the increases in cost over previous assessments are many. Some of the more pertinent are:

1. The increasing availability of up-to-date engineering estimates for projects previously assessed in their rudimentary planning stages. For example, a project which went under construction in New York City earlier in 1971 was estimated by the designers to cost about $100 million. The lowest bid received on the project was about $229 million. Experiences such as these have prompted many communities into updating their cost estimates.
2. More comprehensive assessing and reporting.
3. Acceleration of construction schedules. The State of California has advised its communities that the State's Clean Water Grant Program is for a five-year period only. All required pollution control facilities are to be initiated prior to the termination of the program or they will not receive State assistance. This required the San Francisco Bay Area, for example, to condense its thirty year program into five.
4. The necessity of municipalities meeting water quality standards and related implementation plans within the next five years. The enforcement of these requirements are undoubtedly a factor in the shaping of imminent needs and their associated costs.
5. The rise in the number of required tertiary treatment facilities and their associated costs.
6. The rise in the cost of construction.

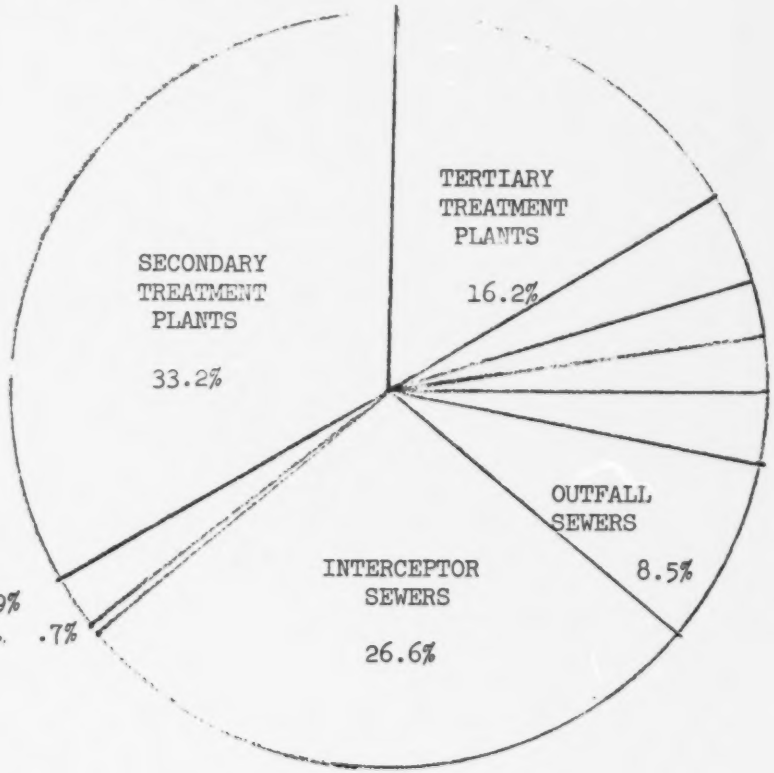
It should be noted that, in projecting the cost for needed facilities for fiscal years 1973 onward, it may be necessary to

apply a factor which will reflect any rises in construction cost during those years. Since the percentage rise of the past year cannot at this time be considered as an appropriate indicator of the rise expected in the years to come, no attempts were made in this report to project any future inflationary effects on the estimated cost of future construction. All costs in this survey were based on end-of-the-year 1971 dollars.

TABLES AND FIGURES

FIGURE 1

Facilities Required* and Percent of Total For Municipalities With or Serving Populations of 10,000 Or More Based on Needs Survey Completed in December 1971, Covering the Period FY-1972-76, Inclusive



* Excludes Combined Sewer Overflow Control Facilities

TABLE 1.

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
California	7.7
Colorado	87.
Connecticut	87.
Delaware	62.
District of Columbia	347.
Florida	480.
Georgia	70.
Hawaii	50.
Idaho	14.
Illinois	1,043.
Indiana	176.
Iowa	111.
Kansas	52.7
Kentucky	117.0
Louisiana	152.7
Maine	157.4
Maryland	342.7
Massachusetts	425.6
Michigan	788.8
Minnesota	295.
Mississippi	34.1
Missouri	268.
Montana	31.
Nebraska	2.0
Nevada	7.
New Hampshire	37.8
New Jersey	1,308.7
New Mexico	19.
New York	1,741.0
North Carolina	125.3
North Dakota	8.4
Ohio	732.5
Oklahoma	69.8
Oregon	78.6
Pennsylvania	616.
Rhode Island	37.7
South Carolina	5 .6
South Dakota	.5
Tennessee	3.9
Texas	328.7
Utah	22.6
Vermont	38.0
Virginia	280.1
Washington	216.3
West Virginia	51.
Wisconsin	190.8
Wyoming	1.7
Guam	2.7
Puerto Rico	93.0
Virgin Islands	14.6

* Excludes Storm Water Overflow Control Facilities.

December 28, 1970

TABLE 2. - Summary of survey responses

	No. of Municipalities Contacted	No. of Responses	Percent Response	Responses Indicating Needs
TOTALS	2294	2191	95.5	1435
REGION I	174	174	100.0	88
Connecticut	86	86	100.0	50
Maine	17	17	100.0	11
Massachusetts	62	62	100.0	45
New Hampshire	7	7	100.0	7
Rhode Island	13	13	100.0	4
Vermont	9	9	100.0	3
REGION II	204	197	91.9	157
New Jersey	105	97	92.4	57
New York	100	99	99.0	99
Puerto Rico	1	1	100.0	1
Virgin Islands	--	--	--	--
REGION III	300	288	96.3	150
Delaware	3	3	100.0	1
Maryland	20	20	100.0	10
Pennsylvania	215	201	93.4	130
Virginia	44	44	100.0	22
West Virginia	19	19	100.0	16
Dist.of Columbia	1	1	100.0	1
REGION IV	323	317	98.1	217
Alabama	39	39	100.0	20
Florida	85	85	100.0	71
Georgia	41	41	100.0	27
Kentucky	30	25	83.3	19
Mississippi	28	28	100.0	23
North Carolina	41	41	100.0	29
South Carolina	29	29	100.0	24
Tennessee	30	29	96.6	23
REGION V	579	579	100.0	391
Illinois	144	144	100.0	63
Indiana	57	57	100.0	42
Michigan	135	135	100.0	59
Minnesota	45	45	100.0	15
Ohio	153	153	100.0	126
Wisconsin	45	45	100.0	31
REGION VI	239	214	89.5	174
Arkansas	23	21	91.3	19
Louisiana	32	28	87.5	23
New Mexico	15	14	93.3	13
Oklahoma	29	28	96.5	15
Texas	140	123	87.8	24
REGION VII	105	84	80.0	57
Iowa	25	19	76.0	14
Kansas	41	29	70.7	19
Missouri	27	24	88.8	15
Nebraska	12	12	100.0	9
REGION VIII	80	80	100.0	59
Colorado	27	27	100.0	17
Montana	10	10	100.0	8
North Dakota	9	9	100.0	8
South Dakota	8	8	100.0	6
Utah	21	21	100.0	10
Wyoming	5	5	100.0	1
REGION IX	193	175	90.6	126
Arizona	4	4	100.0	4
California	174	156	89.6	107
Hawaii	8	8	100.0	8
Nevada	6	6	100.0	6
American Samoa	--	--	--	--
Tr.Terr.of Pac.Is.	--	--	--	--
Guam	1	1	100.0	1
REGION X	95	93	97.8	60
Alaska	2	2	100.0	2
Idaho	11	11	100.0	10
Oregon	34	34	100.0	26
Washington	48	46	95.8	22

TABLE [illegible]. - Estimated Cost of Construction Needed Municipal Waste Treatment Facilities For Municipalities With Or Serving Populations of 10,000 or More, For Period FY-1972-76, Based on Survey Completed in December 1971*

TOTALS	14,0[illegible].5
Alabama	68.2
Alaska	[illegible].3
Arizona	1[illegible].0
Arkansas	40.8
California	1,74[illegible].2
Colorado	6[illegible].3
Connecticut	14[illegible].9
Delaware	[illegible].2
Dist. of Columbia	10[illegible].7
Florida	52[illegible].8
Georgia	10[illegible].5
Hawaii	60.7
Idaho	[illegible].4
Illinois	1,11[illegible].0
Indiana	47[illegible].7
Iowa	17[illegible].0
Kansas	4[illegible].9
Kentucky	115.6
Louisiana	89.8
Maine	[illegible].3
Maryland	660.3
Massachusetts	495.6
Michigan	1,166.1
Minnesota	260.4
Mississippi	[illegible].7
Missouri	255.2
Montana	2[illegible].2
Nebraska	8[illegible].4
Nevada	[illegible].9
New Hampshire	8[illegible].7
New Jersey	1,24[illegible].6
New Mexico	10[illegible].5
New York	1,27[illegible].8
North Carolina	10[illegible].9
North Dakota	[illegible].1
Ohio	909.6
Oklahoma	86.3
Oregon	120.0
Pennsylvania	516.7
Rhode Island	36.[illegible]
South Carolina	98[illegible]
South Dakota	[illegible]
Tennessee	158.9
Texas	380.8
Utah	26.0
Vermont	0
Virginia	308.9
Washington	153.[illegible]
West Virginia	34.0
Wisconsin	176.[illegible]
Wyoming	[illegible].9
Guam	3.0
Puerto Rico	14[illegible].3
Virgin Islands	0

* Excludes Combined Sewer Overflow Control Facilities.

December 1971

TABLE 4. - Estimated Cost, By Fiscal Ye... Construction of Needed Municipal Waste Treatment Facilities For Municipalities ... Serving Populations of 10,000 or More, For Period FY-1972-76, Based on Survey Completed in December 1971*
($ Millions)

	FY 1972	FY 1973	FY 1974	FY 1975	FY 1976	Total
TOTALS	3,558.91	1,030.26	2,513.99	1,874.86	1,127.[illegible]	[illegible]
Alabama	16.66	10.87	9.53	12.03	[illegible]	[illegible]
Alaska	.03	.04	.02	.08	[illegible]	[illegible]
Arizona	2.70	8.97	.60	.47	[illegible]	[illegible]
Arkansas	8.27	22.08	9.11	8.37	[illegible]	[illegible]
California	180.06	778.18	179.44	284.82	[illegible]	[illegible]
Colorado	14.12	23.11	6.45	7.39	[illegible]	[illegible]
Connecticut	136.97	37.11	9.04	2.93	[illegible]	[illegible]
Delaware	.00	3.65	31.33	3.58	10.[illegible]	[illegible]
Dist. of Columbia	.00	108.70	.00	.00	[illegible]	[illegible]
Florida	283.64	143.76	89.38	101.63	13.[illegible]	[illegible]
Georgia	35.24	61.95	10.81	3.20	[illegible]	[illegible]
Hawaii	15.66	28.34	4.66	12.01	.00	60.67
Idaho	14.06	4.85	4.07	.46	.00	[illegible]
Illinois	128.13	300.58	213.31	382.92	28.[illegible]	[illegible]
Indiana	84.92	174.34	100.17	61.93	55.[illegible]	476.68
Iowa	7.20	74.51	69.45	3.00	18.[illegible]	[illegible]
Kansas	7.12	22.20	4.56	3.11	7.95	44.94
Kentucky	14.02	23.72	9.63	39.53	31.70	118.60
Louisiana	24.02	24.27	17.14	14.82	9.57	89.82
Maine	6.43	24.23	4.36	23.20	.10	[illegible]
Maryland	163.79	268.21	214.62	26.90	49.75	[illegible]
Massachusetts	142.71	132.04	102.00	103.90	15.00	495.65
Michigan	258.99	458.04	267.37	90.03	91.66	1,166.09
Minnesota	122.88	[illegible]	25.20	30.78	12.94	260.42
Mississippi	5.46	16.15	6.91	2.40	.80	31.72
Missouri	11.56	143.94	64.80	9.58	25.29	255.17
Montana	14.26	2.05	5.84	.00	.00	[illegible]
Nebraska	.35	26.39	21.81	24.15	15.72	88.42
Nevada	7.88	20.87	7.53	4.66	.00	40.94
New Hampshire	3.13	27.76	47.90	6.75	4.15	89.69
New Jersey	197.24	585.97	112.19	304.50	49.60	1,249.50
New Mexico	6.53	10.75	.09	.65	.23	[illegible]
New York	813.10	341.16	112.97	2.46	3.10	1,272.79
North Carolina	10.76	51.85	24.40	12.97	2.00	101.95
North Dakota	.35	2.10	1.00	.00	.69	4.14
Ohio	100.94	253.73	213.33	27.44	118.14	909.58
Oklahoma	28.40	6.31	7.42	8.16	36.01	86.30
Oregon	53.44	35.54	4.75	14.03	12.20	119.96
Pennsylvania	111.25	161.18	120.52	69.91	53.50	516.66
Rhode Island	7.94	16.31	12.00	.00	.00	36.25
South Carolina	34.66	22.90	25.91	12.23	2.40	98.10
South Dakota	1.26	1.53	2.46	.98	.42	6.65
Tennessee	63.69	47.13	25.96	11.43	10.65	158.86
Texas	110.32	123.68	53.55	52.28	19.95	389.78
Utah	7.09	3.47	2.45	1.91	11.05	25.97
Vermont	.00	.00	.00	.00	.00	.00
Virginia	196.03	41.29	13.42	11.64	46.46	308.84
Washington	37.80	52.45	18.31	34.90	9.95	353.41
West Virginia	6.56	24.08	1.60	1.74	.00	33.98
Wisconsin	75.47	71.27	15.81	5.60	8.31	176.46
Wyoming	.00	.90	.00	.00	.00	.90
Guam	.30	2.73	.00	.00	.00	3.03
Puerto Rico	8.72	52.23	75.98	7.10	1.28	145.31
Virgin Islands	.00	.00	.00	.00	.00	.00

* Includes Combined Sewer Overflow Control Facilities.

December 1971

TABLE 5. - Estimated Cost of Construction In Accordance With Regulatory Requirements 1/ 2/

Requirements	Estimated Cost Of Facilities To Be Constructed ($ Billion)	%
Locally Developed Plan 3/	3.721	27.0
State Approved Implementation Schedule	3.882	28.2
Federal Approved Water Quality Standards Implementation Plan	3.799	27.6
FY '71 More Stringent Federally Approved WQS	.221	1.6
Federal Enforcement Procedures or Actions	1.251	9.1
State Court Order	.781	5.7
Federal Court Order	.104	.8
Total	13.760	
Facilities on which no requirement data submitted.	.254	
	14.014	

NOTES:

1. Based on survey of needs of municipalities with populations of 10,000 or more for period FY-72-76.
2. Excludes combined sewer overflow control facilities.
3. With few exceptions, most of the projects identified with this requirement are being planned or developed in conformance with anticipated Federal and State standards.

December 1971

TABLE 6. - Cost Summary of Needed Facilities by Description and Type 2/
($ Million)

DESCRIPTION	TYPE					
	New Facility	Modification 1/	Increase In Capacity	Increase In Treatment Level	Increase In Treatment Level and Capacity	Total
Primary	108.0	35.5	253.3	1.0	9.0	406.8
Intermediate	4.8	2.3	22.6	52.3	14.1	96.1
Secondary	1512.0	231.2	731.0	876.9	1297.5	4648.6
Tertiary	665.1	10.8	118.3	620.6	846.1	2260.9
Nutrient Removal	270.6	1.6	2.4	17.4	33.4	325.4
Plant Elements	281.2	126.3	69.9	31.0	67.6	576.0
Ancillary Works	5208.0	58.0	331.0	15.2	88.0	5700.2
Totals	8049.7	465.7	1528.5	1614.4	2355.7	14014.0

1/ No increase in capacity or treatment.
2/ For period FY-1972-76.

December 1971

TABLE 7. - Estimated Cost of Tertiary [illegible]ment, Nitrate and Phosphate Removal Facilities Planned for Construction [illegible] FY-1972-76, By Municipalities With Or Serving Populations of 10,000 or More
($ Million)

	Tertiary Treatment	Nitrate Removal	Phosphate Removal
TOTALS	2,260.24	176.79	148.35
Alabama			
Alaska			
Arizona			
Arkansas	14.80		
California	113.46		
Colorado	3.70		
Connecticut	8.20		
Delaware			
Dist. of Columbia	31.68	77.01	
Florida	157.35	.50	.50
Georgia	37.86		
Hawaii			
Idaho			
Illinois	497.59	94.77	57.25
Indiana	85.81	3.06	14.02
Iowa	14.65		
Kansas	7.02		
Kentucky	11.17	.36	
Louisiana			
Maine			
Maryland	292.66		.55
Massachusetts	47.70		
Michigan	112.24	7.15	22.18
Minnesota	11.[illegible]		3.14
Mississippi			
Missouri	2.83		
Montana			
Nebraska	7.40		
Nevada			
New Hampshire	6.50		
New Jersey	86.89		
New Mexico	11.85		
New York	108.66	7.78	28.24
North Carolina	45.12		1.62
North Dakota			
Ohio	184.05	3.66	10.20
Oklahoma	37.31		
Oregon	5.27		
Pennsylvania	62.45	12.00	4.86
Rhode Island			
South Carolina			
South Dakota			
Tennessee	5.38		
Texas	89.56		
Utah	15.00		
Vermont			
Virginia	124.20		1.55
Washington	.70		
West Virginia			
Wisconsin	16.54	10.50	4.24
Wyoming			
Guam			
Puerto Rico	3.00		
Virgin Islands			

December 1971

TABLE 8. - Expected Year Of Operation Of Projects To Be Initiated In Fiscal Years 1972-76 In Municipalities With Or Serving Populations of 10,000 or More

Year Of Facility Operation	Estimated Cost Of Facilities ($ Millions)
FY-1972	120
FY-1973	1,235
FY-1974	2,932
FY-1975	3,026
FY-1976	3,292
FY-1977	2,152
FY-1978 +	1,257
Total	14,014

December 1971

TABLE 9. - Number of Municipalities*, Having Construction Needs in the FY-72-76 Period, With User Chargers, and the Method Upon Which Charge Based and Year Rate Established

Year Rate Established	Basis of Use Charge					
	Hydraulic Volume	Quantity of BOD	Quantity of Solids	Both BOD & Solids	Both Volume & Quality	Other
Prior to 1941	6	0	0	[illegible]	0	9
1941 - 1950	17	0	0	0	3	13
1951 - 1960	148	0	0	1	23	56
1961 - 1965	121	1	0	1	40	70
1966 - 1970	407	2	0	3	118	162
1971	150	0	0	3	78	83
No years indicated	30	0	0	0	14	73
Total	879	3	0	8	276	466

* With or serving populations of 10,000 or more.

December 1971

TABLE 10. - Estimated Number of Employees Needed to Man Facilities,* Proposed For Construction During FY 72-76, and Fiscal Year Facilities Expected to be Operational

Fiscal Year	Categories of Employment				
	Professional	Operation and Maintenance	Other	Totals	Percent
1972	51	139	36	226	1.8
73	350	1,207	401	1,9?8	15.5
1974	494	2,323	687	3,504	27.6
1975	461	1,972	535	2,968	23.4
1976	354	1,343	348	2.045	16.1
1977	189	66?	225	1,080	8.5
1978	75	371	130	576	4.6
1979	33	191	34	258	2.0
1980 +	10	38	13	61	.5
TOTALS	2,017	8,250	2,409	12,676	100.0
PERCENT	15.9	65.1	19.0	100.0	

* For municipalities with or serving populations of 10,000 or more.

December 197?

TABLE 11. - Estimated Construction Cost of Needed Sewage Treatment Facilities Planned For The Period FY-1973-74 As Of December 1971
($ Million)

TOTALS	14,447.2
Alabama	98.7
Alaska	12.0
Arizona	13.6
Arkansas	58.2
California	1,539.7
Colorado	146.7
Connecticut	220.8
Delaware	95.0
Dist. of Columbia	103.6
Florida	528.1
Georgia	141.7
Hawaii	48.3
Idaho	31.7
Illinois	909.9
Indiana	490.1
Iowa	168.3
Kansas	54.5
Kentucky	95.2
Louisiana	137.3
Maine	140.9
Maryland	370.1
Massachusetts	247.2
Michigan	1,162.2
Minnesota	293.9
Mississippi	51.3
Missouri	241.0
Montana	24.3
Nebraska	24.1
Nevada	41.8
New Hampshire	121.0
New Jersey	1,222.0
New Mexico	30.8
New York	1,610.4
North Carolina	134.4
North Dakota	6.8
Ohio	840.9
Oklahoma	67.1
Oregon	123.6
Pennsylvania	780.5
Rhode Island	7.2
South Carolina	4.0
South Dakota	3.9
Tennessee	209.0
Texas	403.4
Utah	20.5
Vermont	38.3
Virginia	424.9
Washington	129.7
West Virginia	72.8
Wisconsin	253.6
Wyoming	3.9
Guam	12.7
Puerto Rico	126.3
Virgin Islands	13.0

TABLE 12. - Estimated Construction Cost of Needed Sewage Treatment Facilities Planned for the Period FY-1972-1976
(4 Million)

	FY-1972-1974	FY-1975	FY-1976	FY-1972-1976
TOTAL	14,247.7	2,278.8	2,289.2	18,815.6
Alabama	12.7	7.9	5.1	25.7
Alaska	2.8	7.5	--	10.3
Arizona	19.6	6.2	1.4	27.2
Arkansas	2.2	--	--	2.2
California	1,202.7	319.0	340.8	1,862.5
Colorado	48.3	2.0	6.1	56.4
Connecticut	74.8	--	--	74.8
Delaware	95.6	2.5	5.6	103.7
Dist. of Columbia	103.6	--	--	103.6
Florida	208.2	106.3	17.0	331.5
Georgia	111.7	--	12.6	124.3
Hawaii	18.1	14.1	--	32.2
Idaho	3.7	.3	.4	32.4
Illinois	909.9	352.9	38.7	1,331.5
Indiana	470.1	42.1	27.6	539.8
Iowa	166.3	21.8	7.2	197.3
Kansas	54.5	3.2	11.6	69.3
Kentucky	96.1	39.5	27.1	162.8
Louisiana	137.2	17.7	.1	155.0
Maine	280.3	35.4	25.0	340.7
Maryland	660.1	13.7	36.6	710.4
Massachusetts	547.2	80.0	--	627.2
Michigan	1,162.2	100.4	130.0	1,392.6
Minnesota	295.9	30.8	12.9	339.6
Mississippi	57.3	14.5	18.2	90.0
Missouri	204.0	38.1	27.4	269.5
Montana	24.3	--	3.0	27.3
Nebraska	54.1	24.1	15.7	93.9
Nevada	4.8	1.3	--	43.1
New Hampshire	161.0	33.5	10.5	205.0
New Jersey	1,199.0	239.6	6.3	1,447.2
New Mexico	32.8	--	--	40.8
New York	1,610.4	102.0	167.2	1,879.6
North Carolina	134.4	18.2	1.1	153.7
North Dakota	6.8	--	.3	7.1
Ohio	840.9	62.7	156.8	1,060.4
Oklahoma	67.1	8.1	39.8	115.0
Oregon	123.6	13.0	12.6	149.2
Pennsylvania	789.5	105.8	1.2	896.5
Rhode Island	71.2	--	--	71.2
South Carolina	94.0	18.8	17.8	130.6
South Dakota	13.8	3.3	.9	18.1
Tennessee	169.0	1.9	7.8	188.7
Texas	403.4	34.4	11.5	449.3
Utah	20.5	1.4	5.5	27.4
Vermont	32.3	6.3	3.7	42.3
Virginia	121.9	11.0	61.5	197.4
Washington	229.7	52.6	5.8	288.1
West Virginia	72.8	23.0	--	95.8
Wisconsin	253.6	6.6	3.9	264.1
Wyoming	3.9	--	--	3.2
Guam	12.7	4.1	.7	17.5
Puerto Rico	136.5	.8	.5	137.8
Virgin Islands	13.0	3.1	3.8	19.9

TABLE 13. - Comparison Between the December 1970 and December 1971 Cost Estimates Of The Construction of Municipal Sewage Treatment Works Through FY-1976
($ Million)

	December 197	December 1970	Increase/ Decrease	Percent Change
TOTALS	14,557.2	12,560.2	1,997.0	16
Alabama	52.7	27.0	25.7	95
Alaska	32.8	28.1	4.7	17
Arizona	19.6	51.0	- 31.4	- 62
Arkansas	31.5	22.0	9.5	43
California	1,429.7	737.5	692.2	94
Colorado	46.1	47.4	- 1.3	- 3
Connecticut	244.8	229.5	15.3	7
Delaware	99.6	66.0	33.6	51
Dist.of Columbia	103.6	347.2	- 243.6	- 70
Florida	528.1	444.2	83.9	19
Georgia	141.7	74.0	67.7	91
Hawaii	48.1	50.8	- 2.7	- 5
Idaho	31.7	14.5	17.2	119
Illinois	909.9	1,043.6	- 133.7	- 13
Indiana	490.1	174.8	315.3	180
Iowa	168.3	111.9	56.4	50
Kansas	54.5	52.7	1.8	3
Kentucky	96.2	117.0	- 20.8	- 18
Louisiana	137.2	132.7	4.5	3
Maine	140.9	157.4	- 16.5	- 10
Maryland	620.1	349.7	270.4	77
Massachusetts	547.2	422.6	124.6	29
Michigan	1,162.2	788.8	373.4	47
Minnesota	295.9	295.2	.7	0.2
Mississippi	57.3	34.1	23.2	68
Missouri	241.0	268.2	- 27.2	- 10
Montana	24.3	31.4	- 7.1	- 23
Nebraska	54.1	49.0	5.1	10
Nevada	41.8	47.2	- 5.4	- 11
New Hampshire	121.0	137.8	- 16.8	- 12
New Jersey	1,122.0	1,308.7	- 186.7	- 14
New Mexico	30.8	19.6	11.2	57
New York	1,610.4	1,721.0	- 110.6	- 6
North Carolina	134.4	125.3	9.2	7
North Dakota	6.8	8.4	- 1.6	- 19
Ohio	840.9	733.5	107.4	15
Oklahoma	67.1	69.8	- 2.7	- 4
Oregon	123.6	78.6	45.0	57
Pennsylvania	789.5	616.4	173.1	28
Rhode Island	71.2	37.7	33.5	89
South Carolina	94.0	57.6	36.4	63
South Dakota	13.9	13.5	.4	3
Tennessee	169.0	88.9	80.1	90
Texas	403.4	398.7	4.7	1
Utah	20.5	22.6	- 2.1	- 9
Vermont	32.3	38.0	- 5.7	- 15
Virginia	424.9	280.1	144.8	52
Washington	129.7	216.3	- 86.6	- 40
West Virginia	72.8	51.4	21.4	42
Wisconsin	253.6	190.8	62.8	33
Wyoming	3.9	1.7	2.2	129
Guam	12.7	9.7	3.0	31
Puerto Rico	128.6	93.0	35.8	38
Virgin Islands	13.0	14.6	- 1.6	- 11

TABLE 14. - Summary of Differences in the Cost of Needs, Through FY-1974, as Assessed in December 19[illegible] and December 1971 Surveys

Percent Increase of December 1971 Over December 1970	No. of States	Increase/Decrease ($ Millions)
Decrease 1/	19	- 904.1
0 - 10%	7	32.5
11 - 25%	5	214.6
26 - 50%	8	850.5
51 - 75%	6	294.2
76 - 100%	6	1,169.6
Over 100%	3	334.7

1/ Cost of Needs in FY-75 & 76 in 19 States Indicating Lower Needs Through FY-74 in December 1971 Assessment Than in December 1970 Assessment

States	Cost of Needs in 75/76	States	Cost of Needs in 75/76
Arizona	7.6	**New Hampshire	69.0
**Colorado	36.1	**New Jersey	305.9
D.C.	0	**New York	269.2
**Hawaii	24.1	North Dakota	.3
**Illinois	421.6	**Oklahoma	47.9
**Kentucky	66.6	**Utah	6.9
**Maine	60.4	**Vermont	10.0
**Missouri	65.5	Washington	58.4
Montana	3.0	**Virgin Islands	6.9
Nevada	1.3		

**Total needs through FY-76, as assessed in December 1971, exceed needs obtained in December 1970 assessment.

APPENDIX

FLOW CHART-ASSESSMENT OF THE NEED FOR SEWAGE TREATMENT FACILITIES, FY-1972-76

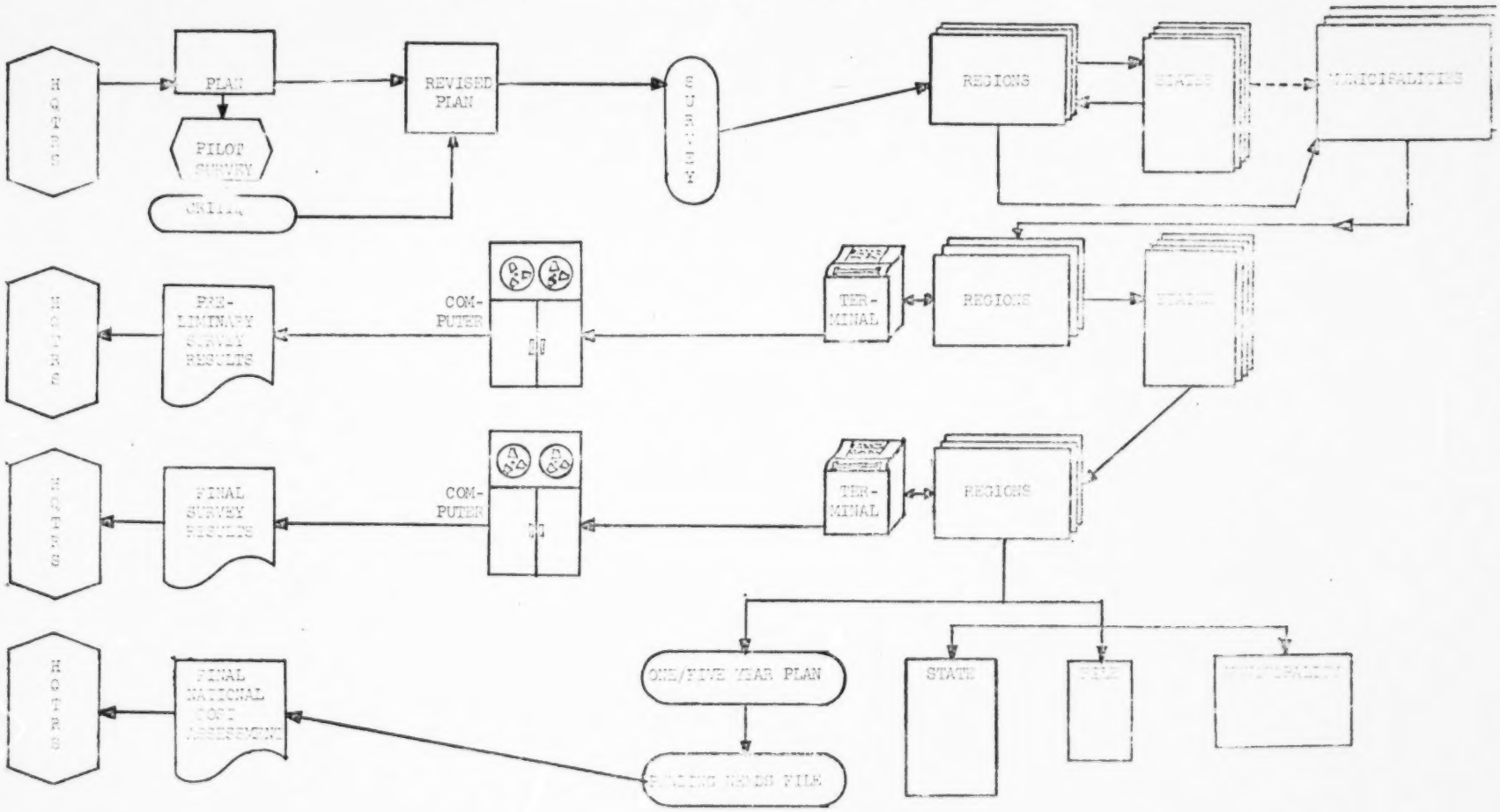


FIGURE A-1

December

ENVIRONMENTAL PROTECTION AGENCY
Office of Water Programs

INSTRUCTIONS FOR MUNICIPALITIES PARTICIPATING IN SURVEY TO ASSESS NATIONAL NEEDS FOR CONSTRUCTION OF SEWAGE TREATMENT FACILITIES

Please review the survey form completely and read these instructions before you start to make entries on the form. We would suggest that you rough out the information on a plain piece of paper. If you have questions regarding the completion of any aspect of this form, please contact:

The purpose of the survey is to record the most accurate information available on your community's needs for waste treatment facilities and associated costs with particular emphasis on those needs required to meet water quality standards implementation schedules and/or enforcement actions through Fiscal Year 1976.

This information is important for us to use in evaluating the scope of pollution problems and in developing appropriate plans of action to meet these problems. Projects for which EPA grants have already been awarded are not to be included in this report.

There are blanks on the form for input from both you and your State water pollution control agency. Please complete only the following:

(402)	(409)	(505)
(403)	(410)	(506)
(404)	(ID#)	(507)
(405)	(501)	(510)
(406)	(502)	(511)
(407)	(Needs)	(512)
(408)	(504)	(513)

If the municipality named in A. on the survey form is no longer responsible for municipal waste, please contact:

In other words, if a new sanitary authority has assumed responsibility for your sanitary wastes, please make the above contact so that we may survey the new sanitary authority and so correct the record on your municipality.

INSTRUCTIONS FOR COMPLETING FORM

(402) Give that portion of population of the municipality, sanitary district, etc., served by the municipality's facilities. Use the latest decennial census figures for this purpose. When the municipality's facilities serve other community(ies), this number should be the total of all population served.

(403) Give the numbers of the Federal congressional districts in which the municipality is located, e.g., 01, 05, 09, etc.

(404) Give the method upon which the use charge is based, e.g., Hydraulic Volume; Quantity of BOD; Quantity of Solids; both Solids and BOD; and, both Volume and Quality. If other means are used, specify the method. Use Keywords shown on attachment #2.

(405) Give the year the present usage rate was established.

Give the name (406), title (407), address (408) and telephone number (409) of the individual providing the information as well as the date (410) it was supplied.

Needs information is reported by discharge. A discharge is defined as: An actual or potential unique deposit directly to a surface body of water, particularly to a river, stream, estuary, lake or pond; or, to the surface which will ultimately reach a surface body of water; or, to a surface which is impounded; or, to underground; or, into another transport system (usually via an interceptor). "Another transport system" is any method of deposit transport whose physical facilities are under the control of an organization different from the discharger (owner of interceptor), such as another municipal sewer authority.

(ID#) A discharge is named by an ID#. The first two digits are the municipality's State code. The next five digits are the municipality's community code. The next four digits are the municipality's treatment facility number (the waste and collection system). The last digit is the discharge number. If a facility has two or more discharges, an ID# for each discharge should be repeated for each discharge with only the 12th digit changing. Please check the listing of discharges for your municipality for correctness. Change the last five digits of the ID# if the listing of discharges is incorrect. Where only one discharge for a facility exists, a zero is assigned in the 12th digit for the discharge. If two or more discharges exist for the same facility, use 1, 2, 3, and so on for the 1st, 2nd, 3rd, and so on discharges.

Example: 41 67840 0001 0 Portland, Columbia Blvd. Treatment Plant
41 67840 0002 0 Portland, Tryon Creek Treatment Plant

Example: 41 67840 0001 1 Portland, Col. Blvd. Treatment Plant Discharge #1
41 67840 0001 2 Portland, Col. Blvd. Treatment Plant Discharge #2

95

(501) & (502) Give the discharge name, e.g., Portland, Columbia Blvd. Treatment Plant; Portland, Johnson Creek Interceptor; etc. Include the facility name in the discharge name.

(Needs) Describe, using the Keyword List appended as Attachment #1, the needs for the discharge. (Do not include projects currently receiving EPA financial assistance.) A need is defined as a project for which monies have been or will be requested to accomplish: the construction of a new facility; the modification of an existing facility; an increase in the capacity or treatment levels; or an increase in capacity and treatment levels. To identify such a need, two words from the attached list must be used.

The first three characters of the need identifier represent action; e.g., "NEW" meaning "New Facility." The second three characters of the need identifier describe the needed action; e.g., "TER" meaning "Tertiary Treatment." "NEWTER" would then be translated to mean a "New Facility with a capability of Tertiary Treatment." An "INTSEC" means that the Treatment Level will be increased to the Secondary Level. In each case the acronym must begin with the three letter word which identifies the facility action and be followed by the action description. While the need categories of Primary, Intermediate, Secondary, and Tertiary may incorporate some of the other needs, please identify separately each need defined on the Keyword List.

It is possible that there can be two or more identical needs for the same discharge. When recording this situation, the need entries must be distinguished by the addition of a digit in the 7th character position of the need word.

Continuing the previous example:

4167840 0001 1 Portland, Columbia Blvd. T. P.	INTSEC
	NEWSIN 1
	NEWSIN 2
4167840 0002 1 Portland, Tryon Creek T. P.	INCSEC

The second and third entries indicate two separate interceptor projects, the wastes from which will be treated at the Columbia Blvd. Treatment Plant. Since the needs are to be satisfied by two separately timed and funded projects, they are identified separately by the addition of the digits 1 and 2 following the need acronym.

(504) Give the cost in current year dollars of that portion of the project eligible for EPA assistance (i.e., include items such as engineering and administration, but do not include ineligible costs such as collection system.)

(505) Give the percentage, based on flow quantity, of the effluent from this discharge which can be attributed to industrial wastes.

(506) Give the date, by year and month (71/11), that the municipality plans start of construction.

(507) Give the date, by year and month (73/01), that the municipality plans to begin operations with the project (need satisfied).

(510) Give the reason for the requirement; e.g., to meet WQS; Court order; Federal Enforcement Conference; State Enforcement Conference, etc. (See Attachment #2.)

(511)(512)(513) Give additional employee requirements which are directly attributable to the construction, improvement, etc. Show these in the categories of Professional, Operation and Maintenance, and others. Although the types of personnel are named, show total numbers only in each numbered column; e.g.:

(511)
Professional includes:
(Superintendent)
(Asst. Superintendent)
(Operations Supervisor)
(Chemist)
(Biologist)
(Engineer)
(Sanitary Engineer)

Show as: (511)
3

(512)
Operations/Maintenance includes:
(Shift Foreman)
(Operator)
(Maintenance Supervisor)
(Mechanical Maintenance Foreman)
(Mechanic)
(Maintenance Helper)
(Electrician)
(Painter)
(Laborer)

Show as: (512)
7

(513)
Other includes:
(Other Para-Professionals, e.g., Laboratory Technician)
(Storekeeper)
(Clerk Typist)
(Automatic Equipment Operator)
(Laborer)
(Clerical)
(Other)

Show as: (513)
0

37

FACILITY ACTION

	KEY WORD
New Facility	NEW
Modification (no increase in capacity or treatment)	MOD
Increase in Capacity	INC
Increase in Treatment Level	INT
Both increase in Treatment Level and Capacity	ICT

FACILITY DESCRIPTION

	KEY WORD
Primary	PRI
Intermediate $<85\%$ BOD Removal	INT
Secondary $\geq 85\%$ BOD Removal	SEC
Tertiary	TER
Phosphate Removal	PHO
Nitrate Removal	NIT
Disinfection	DIS
Sludge Processing	SLP
Sludge Disposal	SLD
Outfall	OUT
Deep Ocean Outfall	DOO
Sanitary Intercepter Sewer	SIN
Combined Intercepter Sewer	CIN
Pumping Station	IPU
Force Main	IMN
Combined Sewer Overflow Control at Sewer	OCS
Combined Sewer Overflow Control at Plant	OCP

REASONS FOR REQUIREMENT

(in hierarchial order-lowest to highest)

LOC - Locally Developed Plan

SQS - State Approved Implementation Schedule

WQS - Federal Approved Water Quality Standards Implementation Plan

CQS - FY '71 More Stringent Federally Approved WQS

ENF - Federal Enforcement Procedures or Actions

CRT - State Court Order

FED - Federal Court Order

CHARGE CODES

QUAHYD - Hydraulic Volume

QUABOD - Quantity of BOD

QUASOL - Quantity of Solids

BODSOL - Both BOD & Solids

QULVOL - Both Volume & Quality

OTHERS - Other